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10/586,282	03/06/2007	Guillaume Gautier	292952US0PCT	4687
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EXAMINER KAO, CHIH CHENG G				
ART UNIT 2882		PAPER NUMBER		
NOTIFICATION DATE 10/23/2008		DELIVERY MODE ELECTRONIC		

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary

Application No.

10/586,282

Applicant(s)

GAUTIER ET AL.

Examiner

Chih-Cheng Glen Kao

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 24-58 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 24-58 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/55/08)
Paper No(s)/Mail Date 11/1/06
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date ____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____

DETAILED ACTION

Claim Objections

1. Claim 36, 37, 42-44, and 58 are objected to because of informalities, which appear to be minor draft errors including grammatical and/or antecedent basis problems.

As noted in the following format (location of objection; suggestion for correction), the following objections(s) may be overcome by making the corresponding correction(s): (claim 36, line 2; replacing "2 · 5" with --2.5--), (claim 42, line 3, "scintilator,"; replacing "scintilator" with --scintillator--), (claim 42, line 3, "said scintilator"; replacing "scintilator" with --scintillator--), (claim 43, line 1; replacing "scintilator" with --scintillator--), (claim 44, line 1; replacing "scintilator" with --scintillator--), and (claim 58; inserting --a-- before "monochromator").

Claim 37 is objected to by virtue of its dependency. For purposes of examination, the claims have been treated as such. Appropriate correction is required.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 42-44 and 58 are rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd. v. Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966). See also MPEP 2173.05(q).

3. Claims 42-44 and 58 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

4. Claims 42-44 provide for the use of the analyzer as claimed in claim 24, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced. See MPEP 2173.05(q).

5. Claim 58 provides for the use of a fluoride of claim 45, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced. See MPEP 2173.05(q).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 24-28, 31, 35, and 38 are rejected under 35 U.S.C. 102(b) as being anticipated by Lilley et al. ("Precipitation in LiF Crystals Doped with MgF_2 ").

7. Regarding claim 24 Lilly discloses a manufacture consisting of a single-crystal lithium fluoride (fig. 6) doped with at least 0.018 mol per kg (fig. 6; 1.8 mol % MgF_2 is 0.68 mol Mg^{2+} per kg) of a divalent positive ion M present in the fluorinated state (fig. 6, MgF_2).

Note that recitations (i.e., "An analyzer" or "a monochromator") with respect to the manner in which a claimed apparatus is intended to be employed do not differentiate the claimed manufacture from prior art if the prior art teaches all the structural limitations of the claim. See MPEP 2114.

8. Regarding claim 25, Lilley et al. further discloses wherein the ionic radius of the divalent ion M (fig. 6, Mg^{2+}) necessarily ranges from 55 to 80 picometers.

9. Regarding claim 26, Lilley et al. further discloses wherein M is present in the fluoride (fig. 6, MgF_2) in an amount of at least 0.02 mol per kg (fig. 6; 1.8 mol % MgF_2 is 0.68 mol Mg^{2+} per kg).

10. Regarding claim 27, Lilley et al. further discloses wherein M is present in the fluoride (fig. 6, MgF_2) in an amount of at least 0.023 mol per kg (fig. 6; 1.8 mol % MgF_2 is 0.68 mol Mg^{2+} per kg).

11. Regarding claim 28, Lilley et al. further discloses wherein M is present in the fluoride (fig. 6, MgF_2) in an amount of at least 0.025 mol per kg (fig. 6; 1.8 mol % MgF_2 is 0.68 mol Mg^{2+} per kg).

12. Regarding claim 31, Lilley et al. further discloses wherein M is Mg^{2+} (title).

13. Regarding claim 35, Lilley et al. further discloses wherein the fluoride is present in the form of a cube (paragraph connecting pgs. 571 and 572) or a parallelepiped.

14. Regarding claim 38, Lilley et al. further discloses wherein the fluoride has a cleaved surface (pg. 573, col. 2, last paragraph).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. Claims 29, 30, 36, 37, 45-49, and 53-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lilley et al. as applied to claim 24 above.

16. Regarding claims 29, 30, and 45, Lilley et al. discloses the manufacture as recited above.

However, Lilley et al. fails to specifically disclose wherein M is present in the fluoride in an amount of at most 0.083 mol per kg, or at most 0.045 mol per kg.

Lilley et al. further discloses wherein M is present in the fluoride (fig. 6, MgF_2) in an amount of at least 0.017 mol per kg (pg. 574, col. 2, line 11) and to 0.68 mol per kg (fig. 6; 1.8 mol % MgF_2 is 0.68 mol Mg^{2+} per kg).

It would have been obvious, to one having ordinary skill in the art, at the time the invention was made, to modify the manufacture of Lilley et al. with the above amounts of at most 0.083 mol per kg, or at most 0.045 mol per kg, since where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges or value involves only routine skill in the art (figs. 6 and 8; and pg. 574, col. 2, line 11) as shown by Lilley et al. One would have been motivated to make such a modification for keeping the crystal together more easily (pg. 574, col. 2, lines 10-18) as shown by Lilley et al.

17. Regarding claims 36, 37, 54, and 55, Lilley et al. discloses or suggests a manufacture as recited above.

However, Lilley et al. fails to specifically disclose wherein the volume of the fluoride ranges from $2.5 \times 10^{-3} \text{ cm}^3$ to 30 cm^3 , or wherein the volume of the fluoride ranges from 0.01 to 20 cm^3 .

It would have been obvious, to one having ordinary skill in the art, at the time the invention was made, to further modify the manufacture of Lilley et al. with the above volume, since such a modification would have involved a mere change in the size of a component. A change in size is generally recognized as being within the level of ordinary skill in the art. One would have been motivated to make such a modification for more easily handling the component.

18. Regarding claim 46, Lilley et al. further discloses wherein the ionic radius of the divalent ion M (fig. 6, Mg^{2+}) necessarily ranges from 55 to 80 picometers.

19. Regarding claims 47 and 48, Lilley et al. suggests the manufacture as recited above.

However, Lilley et al. fails to specifically disclose wherein M is present in an amount of at least 0.025 mol per kg, or at most 0.045 mol per kg.

Lilley et al. further discloses wherein M is present (fig. 6, MgF_2) in an amount of at least 0.017 mol per kg (pg. 574, col. 2, line 11) and to 0.68 mol per kg (fig. 6; 1.8 mol % MgF_2 is 0.68 mol Mg^{2+} per kg).

It would have been obvious, to one having ordinary skill in the art, at the time the invention was made, to modify the manufacture of Lilley et al. with the above amounts of at least 0.025 mol per kg, or at most 0.045 mol per kg, since where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges or value involves only routine skill in the art (figs. 6 and 8; and pg. 574, col. 2, line 11) as shown by Lilley et al. One

would have been motivated to make such a modification for keeping the crystal together more easily (pg. 574, col. 2, lines 10-18) as shown by Lilley et al.

20. Regarding claim 49, Lilley et al. further discloses wherein M is Mg^{2+} (title).

21. Regarding claim 53, Lilley et al. further discloses wherein said fluoride is present in the form of a cube (paragraph connecting pgs. 571 and 572) or a parallelepiped.

22. Regarding claim 56, Lilley et al. further discloses wherein said fluoride has a cleaved surface (pg. 573, col. 2, last paragraph).

23. Claims 32, 34, 50, and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lilley et al. as applied to claims 24 and 45 above, and further in view of Khulugurov et al. ("Laser active F-aggregate colour centres in LiF monocrystals doped by divalent impurity cations").

24. Regarding claims 32 and 50, Lilley et al. discloses or suggests the manufacture as recited above.

However, Lilley et al. fails to specifically disclose wherein M is Co^{2+} .

Khulugurov et al. teaches wherein M is Co^{2+} (title; abstract, lines 1-2; and pg. 7006, section titled "2. Experimental details", lines 1-2).

It would have been obvious, to one having ordinary skill in the art, at the time the invention was made, to further modify the manufacture of Lilley et al. with the Co^{2+} of Khulugurov et al., because of the following rationale.

Since the Examiner finds that the prior art (i.e., Lilley et al.) contained a manufacture which differed from the claimed manufacture by the substitution of one element for another, and since the Examiner finds that the substituted elements and their functions were known in the art (as shown by Khulugurov et al. in the title and abstract), the Examiner thus finds that one of ordinary skill in the art could have substituted one known element for another, and the results of the substitution would have been predictable. Therefore, such a claimed combination would have been obvious.

Regarding claims 34 and 52 and for purposes of being concise, Lilley et al. in view of Khulugurov et al. suggests the manufacture as recited above. Khulugurov et al. further teaches wherein M is Co^{2+} (title; abstract, lines 1-2; and pg. 7006, section titled "2. Experimental details", lines 1-2) as noted above.

However, Lilley et al. fails to specifically disclose wherein M is a mixture of at least two ions chosen from Mg^{2+} , Zn^{2+} and Co^{2+} .

It would have been obvious, to one having ordinary skill in the art, at the time the invention was made, to further modify the manufacture of Lilley et al. with the mixture of at least two ions chosen from Mg^{2+} , Zn^{2+} and Co^{2+} , because of the following rationale.

Since the Examiner finds that the prior art included each element claimed, although not necessarily in a single embodiment, with the only difference between the claimed invention and

the prior art being the lack of actual combination of the elements in a single embodiment, and since the Examiner finds that one of ordinary skill in the art could have combined the elements as claimed by known methods, and that in combination, each element merely performs the same function as it does separately, the Examiner thus finds that one of ordinary skill in the art would have recognized that the results of the combination were predictable. Therefore, such a claimed combination would have been obvious.

25. Claims 33 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lilley et al. as applied to claims 24 and 45 above, and further in view of Gupta et al. ("Electrical conductivity studies of cobalt-precipitation in RbCl crystals").

Lilley et al. discloses or suggests the manufacture as recited above.

However, Lilley et al. fails to specifically disclose wherein M is Zn^{2+} .

Gupta et al. teaches wherein M is Zn^{2+} (pg. 271, Section (1)(i), "LiF: ZnF_2 ").

It would have been obvious, to one having ordinary skill in the art, at the time the invention was made, to further modify the manufacture of Lilley et al. with the Zn^{2+} of Gupta et al., because of the following rationale.

Since the Examiner finds that the prior art (i.e., Lilley et al.) contained a manufacture which differed from the claimed manufacture by the substitution of one element for another, and since the Examiner finds that the substituted elements and their functions were known in the art (pg. 271, Section (1)(i), as shown by Gupta et al.), the Examiner thus finds that one of ordinary skill in the art could have substituted one known element for another, and the results of the

substitution would have been predictable. Therefore, such a claimed combination would have been obvious.

26. Claims 39 and 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lilley et al. as applied to claims 24 and 45 above, and further in view of Wittry (US 4882780).

Lilley et al. discloses or suggests the manufacture as recited above.

However, Lilley et al. fails to disclose wherein the fluoride has a surface that is ground and then treated in an acid medium or polished.

Wittry teaches wherein a fluoride (col. 12, lines 38-40) has a surface that is ground and then treated in an acid medium or polished (col. 10, lines 56-69).

It would have been obvious, to one having ordinary skill in the art, at the time the invention was made, to further modify the manufacture of Lilley et al. with the polishing of Wittry, since one would have been motivated to make such a modification for reducing imperfections to obtain better radiation signals from the fluoride.

27. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lilley et al. as applied to claim 24 above, and further in view of van Loef et al. ("Scintillation Properties of $\text{LaCl}_3:\text{Ce}^{3+}$ Crystals: Fast, Efficient, and High-Energy Resolution Scintillators").

Lilley et al. discloses the manufacture as recited above.

However, Lilley et al. fails to disclose at least one scintillator consisting of a rare-earth halide.

Van Loef et al. teaches at least one scintillator consisting of a rare-earth halide (title).

It would have been obvious, to one having ordinary skill in the art, at the time the invention was made, to further modify the manufacture of Lilley et al. with the scintillator of van Loef et al., since one would have been motivated to make such a modification for achieving higher yield, with shorter decay time and good energy resolution (pg. 341, first paragraph of Introduction) as shown by van Loef et al.

28. Claim 41 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lilley et al. and van Loef et al. as applied to claim 40 above, and further in view of van Srivastava et al. (US 2005/0082484).

Lilley et al. as modified above suggests the manufacture as recited above. Van Loef et al. further teaches the rare-earth halide as LaCl_3 (title).

However, Lilley et al. fails to disclose doping with CeCl_3 .

Srivastava et al. teaches doping with CeCl_3 (table 1).

It would have been obvious, to one having ordinary skill in the art, at the time the invention was made, to further modify the manufacture of Lilley et al. as modified above with the dopant of Srivastava et al., since one would have been motivated to make such a modification for providing the desired luminance (paragraph 22) as shown by Srivastava et al.

Furthermore, since the Examiner finds that the prior art contained a manufacture which differed from the claimed manufacture by the substitution of one dopant for another, and since the Examiner finds that the substituted dopants and their functions were known in the art, the Examiner thus finds that one of ordinary skill in the art could have substituted one known dopant

for another, and the results of the substitution would have been predictable. Therefore, such a claimed combination would have been obvious.

29. Claim 58 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lilley et al. as applied to claim 45 above, and further in view of Ohsugi et al. (US 5220591).

Lilley et al. suggests the manufacture as recited above.

However, Lilley et al. fails to disclose the use of a fluoride as a monochromator.

Ohsugi et al. teaches the use of a fluoride as a monochromator (col. 4, lines 1-2).

It would have been obvious, to one having ordinary skill in the art, at the time the invention was made, to further modify the manufacture of Lilley et al. with the use of Ohsugi et al., because of the following rationale.

Since the Examiner finds that the prior art (i.e., Lilley et al.) contained a “base” manufacture upon which the claimed invention can be seen as an “improvement”, and since the Examiner finds that the prior art (i.e., Ohsugi et al.) contained a “comparable” manufacture that has been improved in the same way as the claimed invention, the Examiner thus finds that one of ordinary skill in the art could have applied the known “improvement” technique (of Ohsugi et al.) in the same way to the “base” manufacture (of Lilley et al.) and the results would have been predictable to one of ordinary skill in the art. Therefore, such a claimed combination would have been obvious.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Cheng Glen Kao whose telephone number is (571)272-2492. The examiner can normally be reached on M - F (9 am to 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Chih-Cheng Glen Kao/
Primary Examiner, Art Unit 2882